

1.(amended) An optical coupling structure to connect an optical fiber and a plane optical waveguide, comprising:

X10 a core having same cross-sectional dimensions as core cross sectional dimensions of the plane optical waveguide at one side connecting to the plane optical waveguide, and having width and depth smaller than a core diameter of the optical fiber at a fiber interface side connecting to the optical fiber wherein at least one of width and depth of the core is tapered along an optical axis proximate to the fiber interface side; and,

clad to surround the core.

2.(amended) The optical coupling structure according to claim 1 wherein the width of the core is tapered along the optical axis proximate to the fiber interface side].

3.(amended) The optical coupling structure according to claim 1 wherein the plane optical waveguide is a single mode optical waveguide and the optical fiber is a single mode optical fiber.

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4. The optical coupling structure according to claim 1 wherein a refractive index difference between the core and the clad is larger than that of the optical fiber.

5. The optical coupling structure according to claim 1 wherein each of the core and clad comprises a silica and the optical fiber comprises a silica optical fiber.

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6.(amended) A plane optical circuit to optically connect to optical fiber at a side surface of the plane optical circuit, comprising:

X11 a core having a first refractive index, at least one of width and depth of the core being tapered along optical axis in a part proximate to the side surface, the width and the depth of the core at the side surface being smaller than a core diameter of the optical fiber; and,

clad having second refractive index smaller than the first refractive index to surround the core.